APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/546,494	04/10/2000	Ulf Ahlfors	6563/54132 (3964-11)	3411

7590   07/31/2003

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EXAMINER
NG, CHRISTINE Y

ART UNIT	PAPER NUMBER
2663	

DATE MAILED: 07/31/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 07-01)

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL.**   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-54* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *26,27,53 and 54* is/are allowed. .

6)☒ Claim(s) *1-4,7,11,18,28-31,34,38 and 45* is/are rejected.

7)☒ Claim(s) *5,6,8-10,12-17,19-25,32,33,35-37,39-44 and 46-52* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

    If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____ .

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage
application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

    a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .

4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: .

DETAILED ACTION

Claim Objections

1.   Claims 1 and 28 are objected to because of the following informalities:

     a.   On page 13 lines 7-8, there should be no terms in parenthesis.

     b.   On page 17 line 30, there should be no terms in parenthesis.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

2.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

3.   Claims 1, 2, 28, and 29 are rejected under 35 U.S.C. 103(a) as being

unpatentable over U.S. Patent No. 5,748,629 to Caldara et al in view of U.S. Patent No.

5,764,641 to Lin.

Referring to claims 1 and 28, Caldara et al disclose a method of bandwidth

scheduling in Figure 1 comprising a switching fabric (Element 13) and a bandwidth

scheduler (Element 12) located before the output queues (Elements 22). Caldara et al

do not include that the device accepts a stream of data and then subjects it to a

decision-making algorithm in the bandwidth scheduler to decide if it is forwarded or

interrupted. In Figure 1, Lin shows that data is received from the switching fabric

(Element 12). The data then goes into a controller (Element 18) that uses EPD, a

decision-making algorithm, to prevent "a newly arriving packet from taking up space in

the buffer that may instead be used to hold the cells of packets that have already been

partially transmitted through the switch" (Column 7, lines 18-21). Therefore, it would

have been obvious to one having ordinary skill in the art at the time the invention was

made to include that a stream of data from the switching fabric would be subjected to a

decision-making algorithm in the bandwidth scheduler to decide if it would be forwarded

or interrupted. This would prevent streams of data from taking up space in the buffer

that could be otherwise be used by streams of data already partially transmitted through

the switch, as taught by Lin.

Referring to claims 2 and 29, Caldara et al disclose that incoming cell streams

contain cells, or data packets (Column 6, lines 8-9). These cells are subjected to a

decision-making algorithm in the bandwidth scheduler (Figure 1, Element 12) that

decides if the cell is accepted or rejected. The bandwidth arbiter (Element 12) does this

by sending a request message through the probe crossbar "to query whether or not

sufficient space is available at a destination output queue, or queues 34, to enqueue a

cell" (Column 4, lines 64-66).

4.   Claims 3 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over

U.S. Patent No. 5,748,629 to Caldara et al in view of U.S. Patent No. 5,764,641 to Lin,

and in further view of U.S. Patent No. 6,144,636 to Aimoto et al. Caldara et al and Lin

do not include that the data packets contain information about their flow identity. Aimoto

et al teach that an inputted cell to the switch is converted into the format of an internal

cell by a header conversion circuit (Figure 1, Element 132). As shown in Figure 2C, the

internal cell format includes output port information (Element 221) and traffic class

information (Element 222). Based on this information, the crossbar switch circuit

(Figure 1, Element 105) can transfer the cell to the corresponding output buffer control

circuit (Figure 1, Element 107). Therefore, it would have been obvious to one having

ordinary skill in the art at the time the invention was made to include that the data

packet contains flow identity information, so that the cell can be outputted to the

corresponding output port.

5.   Claims 4, 18, 31 and 45 are rejected under 35 U.S.C. 103(a) as being

unpatentable over U.S. Patent No. 5,748,629 to Caldara et al in view of U.S. Patent No.

5,764,641 to Lin in further view of U.S. Patent No. 6,144,636 to Aimoto et al, and in

further view of U.S. Publication No. 2003/0103450 to Chapman et al.

Referring to claims 4 and 31, Caldara et al, Lin and Aimoto et al do not include

that a limit is set on the maximum accepted bandwidth per port. Chapman et al teach

that each port is assigned a maximum allocated bandwidth. In the case that separate

traffic classes are competing for spare bandwidth, each class will be limited by the

maximum allocated bandwidth (Page 7, Paragraph 0107). Therefore, it would have

been obvious to one having ordinary skill in the art at the time the invention was made

to assign a maximum accepted bandwidth per port so queues can be limited by the this

value when competing for spare bandwidth.

Referring to claims 18 and 45, Caldara et al, Lin and Aimoto et al do not include

that if one traffic class is particularly active, it is forced to give up part of its accepted

bandwidth. Chapman et al show a related example of a control mechanism on page 12,

paragraph 0143. A traffic class (C2) is utilizing 4Mb/s of bandwidth, which is over its

minimum allocated bandwidth of 1 Mb/s, to transmit upstream data to an input port A.

However, another node needs to transmit downstream data to input port A, so C2 is

forced to restrict its data rate to its minimum allocated bandwidth. This way, there will

be bandwidth available for the downstream node to achieve its minimum allocated

bandwidth. Therefore, it would have been obvious to one having ordinary skill in the art

at the time the invention was made to include that if a traffic class becomes particularly

active, it must be forced to give up some of its accepted bandwidth in order for other

streams to achieve their minimum allocated bandwidth.

6.   Claims 7 and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable

over U.S. Patent No. 5,748,629 to Caldara et al in view of U.S. Patent No. 5,764,641 to

Lin in further view of U.S. Patent No. 6,144,636 to Aimoto et al in further view of U.S.

Publication No. 2003/0103450 to Chapman et al, and in further view of U.S. Patent No.

6,292,465 to Vaid et al.   Caldara et al, Lin, Aimoto et al and Chapman et al do not

include that there is a maximum accepted bandwidth per traffic class. Vaid et al teach

that one of the traffic policies includes granting classes "a limit on the total bandwidth

used by the class" (Column 13, lines 45-46). This traffic policy is used to control the

traffic behavior of specific classes. Therefore, it would have been obvious to one having

ordinary skill in the art at the time the invention was made to include a maximum

accepted bandwidth per port in order to help control traffic behavior of specific classes.

7.   Claims 11 and 38 are rejected under 35 U.S.C. 103(a) as being unpatentable

over U.S. Patent No. 5,748,629 to Caldara et al in view of U.S. Patent No. 5,764,641 to

Lin in further view of U.S. Patent No. 6,144,636 to Aimoto et al, and in further view of

U.S. Patent No. 6,292,465 to Vaid et al. Caldara et al, Lin and Aimoto et al do not include that each traffic class is guaranteed a bandwidth up to a limit. Vaid et al teaches that one of the traffic policies includes "granting classes a minimum bandwidth in the presence of congestion or competition" (Column 13, lines 41-43). This traffic policy is used to control the traffic behavior of specific classes. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to guarantee each traffic class a bandwidth up to a limit, in order to help control traffic behavior in the presence of congestion or competition.

Allowable Subject Matter

8.   Claims 26, 27, 53 and 54 are allowed.

9.   Claims 5, 6, 8-10, 12-17, 19-25, 32, 33, 35-37, 39-44, and 46-52 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

10.   The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.
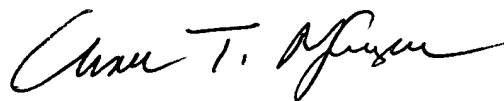
U.S. Patent No. 6,072,800 to Lee

11.   Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christine Ng whose telephone number is (703) 305-8395. The examiner can normally be reached on M-F; 8:00 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Nguyen Chau can be reached on (703) 308-5340. The fax phone numbers

for the organization where this application or proceeding is assigned are (703) 872-9314

for regular communications and (703) 872-9314 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or

proceeding should be directed to the receptionist whose telephone number is (703) 305-

8395.

C. Ng
July 25, 2003

CHAU NGUYEN
SUPERVISORY PATENT EXAMINER
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